Docket No. K-090C

Serial No. 09/525,446
Amdt. dated February 5, 2004
Reply to Office Action of August 5, 2003

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

(1) (Previously Presented) A method for confirming and establishing frame synchronization for sustaining the frame synchronization for a communication channel between a user and a network, the method comprising:

(1) establishing a chip synchronization for the communication channel;

(2) as the chip synchronization is established, using the chip synchronization for establishing the frame synchronization;

(3) determining maintenance of the established frame synchronization; and

(4) restoring the frame synchronization by using pilot bit patterns, when the frame synchronization is failed, wherein a pilot sequence used for the frame synchronization confirmation and establishment is a pilot sequence which provides maximum correlation results of opposite polarities at a starting point or middle point of a correlation period for each received frame.

2. (Previously Presented) A method as claimed in claim 1, wherein the step (3) includes the steps of:

confirming the chip synchronization when the frame synchronization is failed, and

est ablishing the chip synchronization and the frame synchronization when the chip synchronization is failed.

3. Canceled.

4. (Previously Presented) A method for confirming frame synchronization, comprising:

establishing the frame synchronization in an uplink or downlink channel; and,

confirming a sustenance of the established frame synchronization by using a preset pilot sequence,

wherein the pilot sequence used in the confirmation of sustenance of the established frame synchronization provides maximum correlation results of opposite polarities at a starting point and a middle point of a frame correlation period.

5. (Previously Presented) A method as claimed in claim 4, wherein the pilot sequence is a combination of pilot symbols in forms of $(a, \bar{a})$.

6. (Previously Presented) A method for confirming a frame synchronization, comprising:

(1) a network side or a user equipment side establishing the frame

synchronization by using timing information from an opposite side;

(2) confirming the established frame synchronization by using a pilot symbol pattern which provides a correlation value of "0" at points of a correlation period for each received frame except a starting point and a middle point thereof; and,

(3) if it is determined in the step (2) that the frame synchronization is failed, carrying out the step (1) again.

7. (Currently Amended) A method for at least one of establishing and confirming frame synchronization, and for sustaining the frame synchronization for a communication channel between a user and a network, the method comprising:

establishing the frame synchronization in an uplink or downlink channel by using chip synchronization for the communication channel; and

confirming a sustenance of the established frame synchronization by using ~~a preset~~ pilot sequences,

wherein the pilot sequences used in the confirmation of sustenance of the established frame synchronization include

a first code sequence having a significant autocorrelation value at a matched point of a correlation period and having an insignificant autocorrelation value at the other points excluding the matched point, and a second code sequence having the same autocorrelation characteristic as the first selected code sequence, wherein the first and second code sequences have a significant cross-correlation values having polarity opposite to

said significant autoeorrelatian value at a specific delay point.

8. (Previously Presented) The method of claim 7, wherein the second sequence is made by shifting the first code sequence by a certain bit length and by inverting the shifted first code sequence.

9. (Currently Amended) A method for at least one of establishing and confirming a frame synchronization, and for sustaining the frame synchronization for a communication channel between a user arid a network, the method comprising:

(1) a network side or a user equipment side establishing the frame synchronization by using timing information from an opposite side;

(2) confirming the established frame synchronization by using a pilot symbol pattern which comprises a first code sequence having a significant autocorrelation value at a matched point of a correlation period and having an insignificant autocorrelation value at other points excluding the matched point, and a second code sequence having the same autocorrelation characteristic as the first ~~selected~~ code sequence, wherein the first and second code sequences have a significant cross-correlation values having polarity opposite to said significant autocorrelation value at a specific delay point; and

(3) if it is determined in [[sept]] step (2) that the frame synchronization is failed, carrying out step (1) again.

10. (Previously Presented) The method of claim 9, wherein the second sequence is made by shifting the first code sequence by a certain bit length and by inverting the shifted first code sequence.

11. (Previously Presented) A method for at least one of establishing and confirming frame synchronization, and for sustaining the frame synchronization for a communication channel between a user and a network, the method comprising:

establishing the frame synchronization in an uplink or downlink channel by using chip synchronization for the communication channel; and

confirming a sustenance of the established frame synchronization by using present pilot sequences,

wherein the pilot sequences have maximum autocorrelation values corresponding to their length at a matched point of the correlation period and have minimum autocorrelation value having polarity opposite to said maximum autocorrelation value near the half length delay point and have insignificant autocorrelation values at the other points excluding the matched and near the half length delay points.

12. (Currently Amended) A method for at least one of establishing [[an]] and confirming a frame synchronization and for sustaining the frame synchronization for a communication channel between a user and a network, the method comprising:

(1) a network side or a user equipment side establishing the frame

synchronization by using timing information from an opposite side;

(2) confirming the established frame synchronization by using a pilot symbol pattern which comprises code sequences having maximum autocorrelation values corresponding to their length at a matched point of the correlation period and having minimum autocorrelation value having polarity opposite to said maximum autocorrelation value near the half length delay point and having insignificant autocorrelation values at the other points excluding the matched and the half length delay points; and

(3) if it is determined in step (2) that the frame synchronization is failed, carrying out step (1) again.

13. (New) A method for a communication device comprising:

establishing chip and frame synchronization for at least one of a radio link and a channel, wherein a pilot bit pattern is used for at least one of channel estimation, frame synchronization and frame synchronization confirmation, and said pilot bit pattern includes at least one of the following bit patterns for a frame having 15 slots:

Slot No 1 2 3 4.....15
Pilot bit pattern 1 = (1 0 0 0 1 1 1 1 0 1 0 1 1 0 0)
Pilot bit pattern 2 = (1 0 1 0 0 1 1 0 1 1 1 0 0 0 0)
Pilot bit pattern 3 = (1 1 0 0 0 1 0 0 1 1 0 1 0 1 1)
Pilot bit pattern 4 = (0 0 1 0 1 0 0 0 0 1 1 1 0 1 1)
Pilot bit pattern 5= (1 1 1 0 1 0 1 1 0 0 1 0 0 0 1)
Pilot bit pattern 6 = (1 1 0 1 1 1 0 0 0 0 1 0 1 0 0)
Pilot bit pattern 7 = (1 0 0 1 1 0 1 0 1 1 1 1 0 0 0)
Pilot bit pattern 8= (0 0 0 0 1 1 1 0 1 1 0 0 1 0 1)

14. (New) A method of operating a communication device comprising:

establishing chip and frame synchronization using offset information during a first mode;

transitioning from the first mode to a second mode, wherein during the second mode, frame synchronization words are used to confirm frame synchronization;

transitioning from the second mode and a third mode when synchronization has failed, and during the third mode, a failure of the synchronization is checked until synchronization is established using the frame synchronization words; and

transitioning back to from the third mode to the second mode when synchronization is established.

15. (New) The method of claim 14, wherein the frame synchronization words comprises a pilot bit pattern having at least one of following bit patterns for a frame having 15 slots:

Slot No	1 2 3 4.....15
Pilot bit pattern 1 =	(1 0 0 0 1 1 1 1 0 1 0 1 1 0 0)
Pilot bit pattern 2 =	(1 0 1 0 0 1 1 0 1 1 1 0 0 0 0)
Pilot bit pattern 3 =	(1 1 0 0 0 1 0 0 1 1 0 1 0 1 1)
Pilot bit pattern 4 =	(0 0 1 0 1 0 0 0 0 1 1 1 0 1 1)
Pilot bit pattern 5=	(1 1 1 0 1 0 1 1 0 0 1 0 0 0 1)
Pilot bit pattern 6 =	(1 1 0 1 1 1 0 0 0 0 1 0 1 0 0)
Pilot bit pattern 7 =	(1 0 0 1 1 0 1 0 1 1 1 1 0 0 0)
Pilot bit pattern 8=	(0 0 0 0 1 1 1 0 1 1 0 0 1 0 1)

16. (New) The method of claim 14, wherein offset information is frame offset information and/or slot offset information.

17. (New) The method of claim 14, wherein during the first mode, frame synchronization words are used to check chip synchronization failure.